

# SMARTQUIZZER: ADAPTIVE AI POWERED QUIZ GENERATION ENGINE

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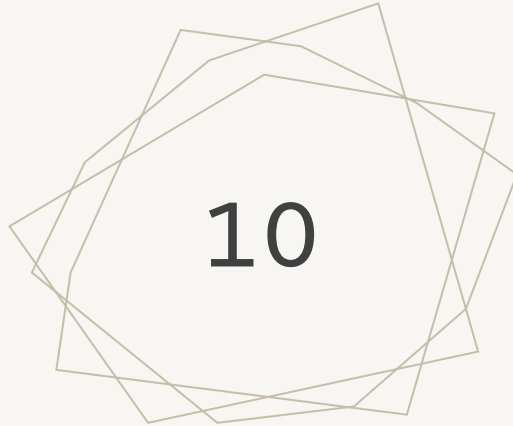


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## INTRODUCTION:

- Traditional quiz tools are **static** and do not adapt to learner skill.
- Students struggle to find quizzes that match their **difficulty level** or **learning pace**.
- **AI SmartQuizzer** solves this by generating **personalized, adaptive quizzes** from any learning material.
- Built using Groq's **LLaMA 3.1** model for intelligent question creation.

## PROBLEM STATEMENT:

Learners face challenges like:

- Generic, non-adaptive quiz systems
- No personalization based on performance
- Limited variety of question types
- Difficulty analyzing learning progress

**Need:** A dynamic, data-driven quiz system that adjusts to user performance.

## PROJECT OVERVIEW:

AI SmartQuizzer enables:

- Uploading learning materials (PDF, Text, URL)
- Automatic quiz creation using AI
- Difficulty adjustment based on user performance
- Performance analytics with charts and statistics
- User accounts with saved preferences

## KEY FEATURES:

- Content Ingestion (PDF/Text/URL)
- AI-generated Questions (MCQ, T/F, Short Answer, Fill in the Blanks)
- Adaptive Difficulty Engine
- Analytics Dashboard
- Admin Panel for Moderation
- Secure Authentication System

## TECHNOLOGY STACK:

**Backend:** Python Flask

**AI:** Groq API – LLaMA 3.1

**Database:** SQLite + SQLAlchemy ORM

**Frontend:** HTML, CSS, JavaScript

**Visualization:** Chart.js

**PDF Parsing:** PyMuPDF

# SYSTEM ARCHITECTURE:

Three-tier architecture:

## Presentation Layer

- HTML (Jinja2 templates)
- JavaScript (quiz logic, real-time updates)
- Chart.js for analytics

## Application Layer

- Flask backend
- AI-based question generation
- Adaptive learning logic

## Data Layer

- SQLAlchemy ORM
- SQLite Database

## APPLICATION FLOW:

- User interacts via UI
- Flask routes receive request
- Backend triggers business logic
- AI model or database performs processing
- Response (HTML/JSON) sent back to user

## AI FEEDBACK SYSTEM:

Feedback includes:

- Encouragement message
- Weak areas & concepts needing improvement
- Study recommendations
- Motivation to continue learning

Appears at the end of each quiz attempt.

## RESULTS AND ANALYSIS:

### Displays:

- Total quizzes taken
- Total questions attempted
- Overall accuracy
- Avg. time per question
- Score trends over time (line chart)
- Subject performance (bar chart)
- Score distribution (doughnut chart)
- Personal best attempt summary

# SCREENSHOTS:


**Welcome, Thejaswini!**

Ready to test your knowledge?

[Start a General Quiz](#)

[Quiz from My Materials](#)

# SCREENSHOTS:



SmartQuizzer

Home Materials New Quiz Leaderboard Profile Contact Logout

## Start a New Quiz

Topic

General Knowledge

Number of Questions (5-30)

10

Your quiz difficulty is **adaptive** and is based on your performance. You can view or reset your current level on your [Profile](#) page.

Start Quiz

# SCREENSHOTS:

The screenshot displays the SmartQuizzer website interface. At the top, a dark blue navigation bar contains the SmartQuizzer logo on the left and a series of links (Home, Materials, New Quiz, Leaderboard, Profile, Contact) and a Logout button on the right. The main content area has a dark background. It features a quiz question titled 'Question 1 of 5' with a sub-label 'MCQ (Single)'. To the right of the question, two buttons show 'Time: 3s' and 'Score: 1'. The question text is 'What is the largest planet in our solar system?'. Below this, there are four radio button options: Earth, Saturn, Jupiter, and Uranus. The 'Jupiter' option is selected and highlighted with a green border and a green checkmark icon. Below the options, a green feedback box contains a checkmark icon, the text 'Correct!', and a paragraph explaining that Jupiter is the largest planet in terms of both mass and size, with a diameter of approximately 142,984 kilometers. At the bottom of this box is a 'Report an issue:' label followed by a text input field.

**SmartQuizzer**

Home Materials New Quiz Leaderboard Profile Contact Logout

Question 1 of 5 MCQ (Single) Time: 3s Score: 1

**What is the largest planet in our solar system?**

☐ Earth

☐ Saturn

☒ Jupiter ✓

☐ Uranus

✓ **Correct!**

Jupiter is the largest planet in terms of both mass and size. It is a gas giant with a diameter of approximately 142,984 kilometers.

Report an issue:

# SCREENSHOTS:

The screenshot displays the SmartQuizzer web application interface. At the top, a dark blue header contains the SmartQuizzer logo on the left and navigation links (New Quiz, Leaderboard, Profile, Contact, Logout) on the right. A teal notification box in the center of the header states "Difficulty adjusted: MEDIUM → HARD". The main content area is dark gray and features a quiz question. The question is "Question 3 of 5" and is a "True/False" type. It includes a "Time: 2s" timer and a "Score: 3" indicator. The question text is "The Great Barrier Reef is the world's largest living structure." Below the question, there are two radio button options: "True" (which is selected and highlighted with a green border and a green checkmark) and "False". Below the options, a green box displays a green checkmark and the text "Correct!". This is followed by an explanatory text: "The Great Barrier Reef is indeed the world's largest living structure, composed of over 2,900 individual reefs and 900 islands." Below this, there is a "Report an issue:" section with a text input field containing the placeholder text "e.g., Unclear question, wrong answer...". At the bottom left, there is a checkbox labeled "Flag as inappropriate/incorrect".

SmartQuizzer

Difficulty adjusted: MEDIUM → HARD

New Quiz Leaderboard Profile Contact Logout

Question 3 of 5 True/False Time: 2s Score: 3

The Great Barrier Reef is the world's largest living structure.

☒ True ✓

☐ False

✓ **Correct!**

The Great Barrier Reef is indeed the world's largest living structure, composed of over 2,900 individual reefs and 900 islands.

Report an issue:

e.g., Unclear question, wrong answer...

☐ Flag as inappropriate/incorrect

## SCREENSHOTS:

 **Correct!**

The Great Barrier Reef is indeed the world's largest living structure, composed of over 2,900 individual reefs and 900 islands.

Report an issue:

e.g., Unclear question, wrong answer...

☐ Flag as inappropriate/incorrect

**Submit Feedback**

# SCREENSHOTS:

Question 5 of 5

True/False

Time: 5s

Score: 4

The human nose can detect over 1 trillion different scents.

☒ True

☐ False

✖ Incorrect

Research suggests that the human sense of smell is capable of detecting an astonishing number of different odors.

💡

 Incorrect. The correct answer was: True


Report an issue:

e.g., Unclear question, wrong answer...


☐ Flag as inappropriate/incorrect

Submit Feedback

# SCREENSHOTS:

 **SmartQuizzer**

HomeMaterialsNew QuizLeaderboardProfileContactLogout




## Quiz Complete!

Great job finishing the quiz!

80%


4 / 5

Correct Answers: 4  
Total Questions: 5  
Grade: **A**  
Accuracy: 80%




Total Time

**2:20**




Avg. Time/Question

**28s**




# SCREENSHOTS:




Completed

Today, 6:18 PM



Difficulty

Hard

Excellent performance! You're doing great! 

### Personalized Feedback

**Great job on the quiz! An 80% score is excellent, showing your strong foundation in General Knowledge.**

**Areas to Review:** It seems you may have missed a couple of questions, including one about the human nose's ability to detect scents. Don't worry, this is a great opportunity to learn and improve!

**Study Tip:** Try to familiarize yourself with interesting and lesser-known facts, like the one about the human nose. This will help you build a broad knowledge base.

*You're on the right track! Keep studying, stay curious, and you'll see continuous improvement in your scores.*

### Review Your Answers

**Q1: What is the largest planet in our solar system?**

**Your answer:** Jupiter

*Explanation: Jupiter is the largest planet in terms of both mass and size. It is a gas giant with a diameter of approximately 142,984 kilometers.*

# SCREENSHOTS:

*Explanation: Jupiter is the largest planet in terms of both mass and size. It is a gas giant with a diameter of approximately 142,984 kilometers.*

## Q2: Which of the following elements are noble gases?

**Your answer:** Helium

**Correct answer(s):** Helium

*Explanation: Noble gases are a group of elements that are chemically inert. Helium is one of the noble gases, known for its light and buoyant properties.*

## Q3: The Great Barrier Reef is the world's largest living structure.

**Your answer:** True

*Explanation: The Great Barrier Reef is indeed the world's largest living structure, composed of over 2,900 individual reefs and 900 islands.*

## Q4: What is the chemical symbol for gold?

**Your answer:** Au

*Explanation: The chemical symbol Au is derived from the Latin word for gold, 'aurum'.*

## Q5: The human nose can detect over 1 trillion different scents.


**Your answer:** False

**Correct answer:** True

*Explanation: Research suggests that the human sense of smell is capable of detecting an astonishing number of different odors.*

 **Retry This Quiz**

 **Start New Quiz**

 **View Analytics**

# SCREENSHOTS:

## Thejaswini's Profile

### My Preferences

Subjects of Interest

Python  
AI

Preferred Difficulty

Hard

Save Preferences

### Recent Performance History

General Knowledge

2025-11-22 12:48

80%

web programming

2025-11-22 11:37

60%

General Knowledge

2025-11-22 11:36

80%

# SCREENSHOTS:

## My Analytics

TOTAL QUIZZES

3

TOTAL QUESTIONS

15

OVERALL ACCURACY

73.3%

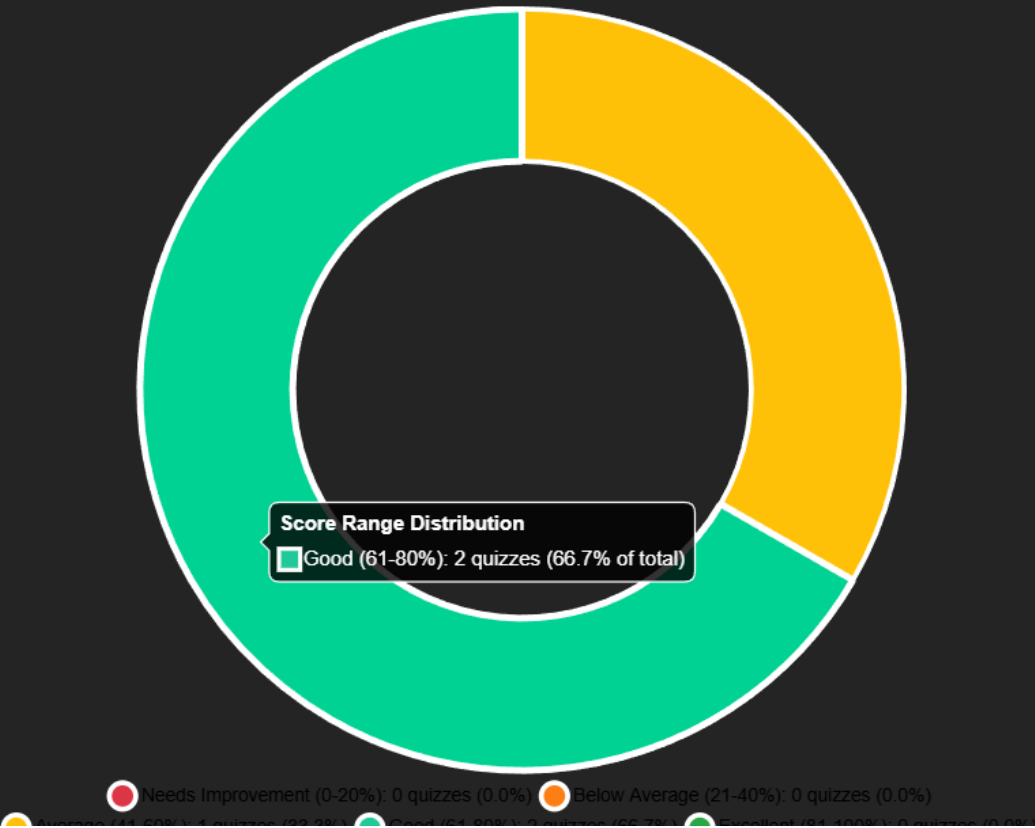
AVG. TIME / Q

5.4s

### Performance Over Time



### Score Distribution



# SCREENSHOTS:

Performance by Subject



# SCREENSHOTS:

## Personal Best Scores

Topic	Score	Grade	Date
General Knowledge	80% (4/5)	A	2025-11-22 12:48
General Knowledge	80% (4/5)	A	2025-11-22 11:36
web programming	60% (3/5)	C	2025-11-22 11:37

## Recent Attempts

Topic	Score	Grade	Date	Action
General Knowledge	80% (4/5)	A	2025-11-22 12:48	<a href="#">View</a>
web programming	60% (3/5)	C	2025-11-22 11:37	<a href="#">View</a>
General Knowledge	80% (4/5)	A	2025-11-22 11:36	<a href="#">View</a>

# SCREENSHOTS:

## All Quiz Attempts

Topic

Filter by topic

Sort by

Date

Order

Desc

Apply

#	Topic	Score	Grade	Date	Action
1	General Knowledge	80% (4/5)	A	2025-11-22 12:48	View
2	web programming	60% (3/5)	C	2025-11-22 11:37	View
3	General Knowledge	80% (4/5)	A	2025-11-22 11:36	View

# SCREENSHOTS:

## General Knowledge - Quiz Details



### Quiz Summary

Topic: General Knowledge

Score: 4/5 (80%)

Completed: 2025-11-22 12:48

### Question 1

✓ Correct

What is the largest planet in our solar system?

Options:

A. Earth

B. Saturn

C. Jupiter

D. Uranus

Correct Answer: 2

Your Answer: —

# SCREENSHOTS:

## My Learning Materials

[Upload New Material](#)

**web programming**

Type: PDF | Uploaded: 2025-11-18

[View & Quiz](#)

## CONCLUSION:

- AI SmartQuizzer provides **personalized, adaptive learning**
- Combines modern AI + web tech for dynamic quiz generation
- Helps students learn efficiently with real-time analytics
- Designed with modular architecture for scalability
- Suitable for both self-learners & institutions

## FUTURE ENHANCEMENTS:

- Add web scraping for URL-based content ingestion
- Improve feedback clarity using deeper LLM reasoning
- Add gamification (badges, levels)
- Support for more advanced LMS integration
- Voice-based quiz interaction

A series of thin, light brown lines forming an abstract, overlapping geometric pattern on the left side of the slide. The lines intersect to create various polygonal shapes, some of which are filled with a very light brown color.

**THANK YOU**